

CLAIMS

What is claimed is:

1. A method of controlling at least one of a transmitting buffer and a receiving
5 buffer of a network controller, comprising:

receiving at least one request for access of a system bus from the transmitting
buffer and the receiving buffer; and

determining a vacancy level of data in the transmitting buffer and an occupancy
level of data in the receiving buffer and granting access to the system bus by the
10 transmitting buffer or the receiving buffer based on the determination result.

2. The method of claim 1, wherein granting access to the system bus
comprises receiving the request for access to the system bus from one of the
transmitting and receiving buffers and granting access to the system bus to the one of
15 the transmitting and receiving buffers sending the request.

3. The method of claim 1, wherein granting access to the system bus
comprises:

determining a present operational state as an emergency mode when both the
20 transmitting and receiving buffers request access to the system bus, the occupancy
level of the receiving buffer is higher than a threshold occupancy level of the receiving
buffer, and the vacancy level of transmitting buffer is higher than a threshold vacancy
level of the transmitting buffer; and

comparing the occupancy level of data in the receiving buffer with the vacancy level of
25 data in the transmitting buffer based on the determination result, and granting access to
the system bus by one of the transmitting buffer or the receiving buffer based on the
determination result.

4. The method of claim 3, wherein when the present operational state does
30 not correspond to the emergency mode, the occupancy level of the receiving buffer is

compared with the vacancy level of the transmitting buffer, and one of the transmitting and receiving buffers is granted access to the system bus, and wherein

the receiving buffer is granted access to the system bus when the occupancy level of the receiving buffer is higher than the vacancy level of the transmitting buffer, and the transmitting buffer is granted access to the system bus when the vacancy level of the transmitting buffer is higher than the occupancy level of the receiving buffer.

5. The method of claim 3, wherein when the present operational state corresponds to the emergency mode, the occupancy level of the receiving buffer is compared with the vacancy level of the transmitting buffer, and one of the transmitting and receiving buffers is granted access to the system bus based on the comparison result, and wherein

when the occupancy level of the receiving buffer is higher than the vacancy level of the transmitting buffer, the receiving buffer is granted access to the system bus if the occupancy level of the receiving buffer is increasing; and

when the occupancy level of the receiving buffer is not higher than the vacancy level of the transmitting buffer, the transmitting buffer is granted access to the system bus if the vacancy level of the transmitting buffer is increasing.

6. The method of claim 5, wherein:

when the occupancy level of the receiving buffer is higher than the vacancy level of the transmitting buffer, the transmitting buffer is granted access to the system bus if the occupancy level of the receiving buffer is not increasing; and

when the occupancy level of the receiving buffer is not higher than the vacancy level of the transmitting buffer, the receiving buffer is granted access to the system bus if the vacancy level of the transmitting buffer is not increasing.

7. A computer readable recording medium recording a program that can execute a method of claim 1 using a computer.

8. A network controller having transmitting and receiving buffers, comprising an internal arbiter monitoring the transmitting and receiving buffers, and arbitrating access to a system bus between the transmitting and receiving buffers in response to requests for access to the system bus from the transmitting and receiving buffers,

wherein the internal arbiter comprises:

an emergency mode determination circuit receiving an occupancy level of data in the receiving buffer and a vacancy level of data in the transmitting buffer, determining whether a present operational state corresponds to an emergency mode as a function of the occupancy level and the vacancy level, and outputting an emergency mode signal;

a first determination circuit for determining if the occupancy level of the receiving buffer is increasing, and outputting a result of the determination as a first signal;

a second determination circuit for determining if the vacancy level of the transmitting buffer is increasing and outputting a result of the determination as a second signal;

a comparing circuit comparing the vacancy level of the transmitting buffer with the occupancy level of the receiving buffer and outputting a comparison result; and

a logic circuit outputting a permission signal to the receiving buffer or the transmitting buffer in response to the first signal, the second signal, and the comparison result, the permission signal granting access to the system bus by one of the transmitting buffer and receiving buffer.

9. The network controller of claim 8, wherein the emergency mode determination circuit comprises:

a first comparing circuit comparing the occupancy level of the receiving buffer with a threshold occupancy level of the receiving buffer and outputting a first comparison result signal;

a second comparing circuit comparing the vacancy level of the transmitting buffer with a threshold vacancy level of the transmitting buffer and outputting a second comparison result signal; and

an AND means performing an AND operation on the first and second comparison result signals output by the first and second comparing circuits and outputting the emergency mode signal.

5 10. The network controller of claim 8, wherein the first determination circuit comprises:

 a first register storing the occupancy level of the receiving buffer; and
 a third comparing circuit comparing an output of the first register with the occupancy level of the receiving buffer and outputting the first signal.

10 11. The network controller of claim 8, wherein the second determination circuit comprises:

 a second register storing the vacancy level of the transmitting buffer; and
 a fourth comparing circuit comparing an output of the second register with the
15 occupancy level of the receiving buffer and outputting the second signal.